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CLAIMS (as originally filed and published)

1. A method for measuring the impedance in a fluidic microsystem comprising a compartment through which a liquid comprising at least one suspended particle flows, and in which a least one impedance detector is arranged, by means of which for detection of the at least one particle at least one impedance value is acquired which is characteristic for the impedance of the compartment and which in the presence of the particle changes in a predetermined way, wherein focusing of the at least one particle takes place in a predetermined space relative to the impedance detector,
characterised in that
focusing involves a movement of the at least one particle relative to the fluid flowing in the compartment as a result of dielectrophoretic forces, which forces are exerted by means of at least two focusing electrodes.

2. The method according to claim 1, in which focusing takes place upstream relative to the impedance detector.

3. The method according to claim 1, in which focusing takes place directly on the impedance detector.

4. The method according to claim 1 or 2, in which focusing involves a movement of the at least one particle in a part of the fluid flow in whose perpendicular projection onto a wall of the compartment the impedance detector is arranged.

5. The method according to any one of the preceding claims, in which focusing involves a movement of the at least one particle such that the perpendicular

distance between the particle and the impedance detector is reduced.

6. The method according to any one of the preceding claims, in which synthetic or biological particles move past the impedance detector.

7. The method according to any one of the preceding claims, in which the at least one impedance value is evaluated in relation to dielectric characteristics of the respective passing particle.

8. The method according to any one of the preceding claims, in which a multitude of impedance values is acquired whose time behaviour is evaluated in relation to the point in time, the direction and/or the speed of the particle moving past.

9. The method according to claim 8, in which from the time behaviour of the impedance values a flow speed of the fluid is acquired.

10. The method according to claim 8 or 9, in which the impedance values are acquired with the impedance detector, wherein the respectively detected particle moves past detector electrodes of the impedance detector, wherein the shape of at least one of the detector electrodes changes in a direction parallel to the direction of the flow of the fluid.

11. The method according to any one of claims 8 to 10, in which the impedance values are acquired with the impedance detector, wherein the respectively detected particle moves past the detector electrodes of the impedance detector, which detector electrodes are arranged on opposite sides of the compartment and are of various shapes.

12. The method according to any one of claims 8 to 11, in which the impedance values are acquired using the impedance detector and at least one further impedance detector which is arranged so as to be spaced apart in the direction of the fluid flow.

13. The method according to any one of the preceding claims, in which focusing of the particle, of which there is at least one, and measuring of the impedance value, of which there is at least one, take place at different frequencies.

14. A measuring device for measuring the impedance in a fluidic microsystem, comprising:
    - an impedance detector which is arranged in a compartment of the microsystem through which a fluid flows; and
    - a focusing device by means of which at least one particle is slidable in close proximity to the impedance detector,

    characterised in that
    the focusing device comprises at least two focusing electrodes for exerting dielectrophoretic forces onto the at least one particle wherein the focusing device forms a funnel-shaped field barrier in the compartment.

15. The measuring device according to claim 14, in which the focusing device is arranged upstream relative to the impedance detector.

16. The measuring device according to claim 14, in which the impedance detector forms part of the focusing device.

17. The measuring device according to any one of claims 14 to 16, in which at least two pairs of focusing electrodes are provided on opposite walls of the compartment, which electrodes form the funnel-shaped field barrier.

18. The measuring device according to any one of claims 14 or 17, in which the lengths of the focusing electrodes differ in the direction of the fluid flow.

19. The measuring device according to any one of claims 14 to 18, in which the impedance detector comprises at least two detector electrodes which are arranged on one wall or on various walls of the compartment.

20. The measuring device according to claim 19, in which at least one of the detector electrodes in a reference direction parallel to the direction of the fluid flow is non-uniform in shape or in which both detector electrodes in a reference direction parallel to the direction of the fluid flow differ in shape.

21. The measuring device according to claim 20, in which the detector electrode, of which there is at least one, is of a shape which comprises
- at least one triangle;
- at least one strip-surface combination; and/or
- at least one electrode structure.

22. The measuring device according to claim 21, in which the at least one electrode structure comprises an electrode breakthrough or an electrode passivation layer.

23. The measuring device according to claim 21, in which the at least one electrode structure is formed by at

least one detector electrode in whose surface a partial electrode is integrated.

24. The measuring device according to any one of claims 21 to 23, in which the partial electrode is of a characteristic size, which essentially is equal to or smaller than the size of the vertical projection of the particle onto the plane of the detector electrode with the partial electrode.

25. The measuring device according to any one of claims 19 to 24, in which the impedance detector comprises at least two detector electrodes which are arranged on at least one wall of the compartment, and extend across the width of the compartment across the direction of the fluid flow.

26. The measuring device according to claim 25, in which the detector electrodes comprise straight electrode strips which are arranged one on top of the other, parallel to the direction of the fluid flow, on the walls of the compartment, wherein the electrode strips comprise different widths and/or structured edges which are arranged so as to be offset across the direction of the fluid flow.

27. The measuring device according to any one of claims 14 to 26, in which at least one further impedance detector, arranged so as to be spaced apart in the direction of the fluid flow, is provided.

28. The measuring device according to any one of claims 14 to 27, in which the at least one impedance detector comprises a frequency filter, by means of which frequencies at which the focusing device is operated can be filtered.